

# CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH

WALTER M. DICKIE, M.D., Director

## Weekly Bulletin



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EDITOR

## *Industrial Hygiene Survey of California Wineries*

The manufacture of wine is one of California's oldest and most important industries, dating back to 1770, when the Spanish padres started the cultivation of wine grape vines at the San Diego Mission, using a vine transplanted from Spain and Mexico. At present there are about 500 bonded wineries in the state, employing about 6500 workers, and producing about 90 per cent of all wine consumed in the United States. During the 1936 vintage season the commercial production of wine in California totaled 53 million gallons.

In order to obtain information on the extent of industrial welfare provisions, potential occupational health hazards, and control measures provided for the health protection of workers exposed to harmful materials and environmental conditions in the course of their work, a survey of California wineries has been made by the Industrial Hygiene Service, State Department of Public Health. Fifty wineries in various parts of the state, employing about 22 per cent of all workers in the industry, were included in the study.

In a report submitted to Dr. Walter M. Dickie, State Director of Public Health, by Dr. J. P. Russell, Chief of the Industrial Hygiene Service, the results of this survey have been summarized as follows:

Twenty-four per cent of the plants studied have fewer than 10 employees; 56 per cent have less than 20 and 96 per cent have less than 100 workers.

In 42 per cent of the plants, employing about one-

half of the workers included in the survey, the services of a part-time safety director are available for the supervision of safety and health conservation measures. Only one of the plants has a safety director who devotes his entire time to this work. About one-quarter of the plants, and one-half of the workers have shop committees organized to cooperate in industrial welfare work. About 90 per cent of plants and workers receive some type of safety-promotion service from insurance companies, the California Wine Institute, and the National Safety Council.

None of the wineries studied has a hospital, plant physician, or nurse. A physician is available to all plants, on short notice, in case of emergencies. One winery has a first-aid room. While first-aid kits are provided for 99 per cent of employees, only 36 per cent are employed in plants where the services of a trained first-aid worker are available. Twelve per cent of employees are given physical examinations prior to employment and 2 per cent are examined annually.

Six per cent of plants and 8 per cent of employees have sick benefit organizations. Records of non-industrial illnesses are kept in two of the 50 wineries surveyed. All plants keep records of accidents and carry full compensation insurance for all occupational diseases.

Wine storage and treatment cellar employees, pomace shovelers, bottlers, and tank car and barrel fillers, comprise about one-half of all employees in



the wineries surveyed. Bottling is the only department in which women are employed.

The materials and environmental conditions to which winery employees are exposed to some degree in the course of their work, and which may have a detrimental effect on health, include alcohol vapors, 76 per cent of all employees; carbon dioxide gas, 53 per cent; excessive dampness, 51 per cent; sulfur dioxide gas, 24 per cent; alkalis, 14 per cent; inorganic salts, 12 per cent; carbon monoxide, 12 per cent; and organic acids, 10 per cent. Other potentially harmful materials to which less than 10 per cent of employees are exposed, include silica dust, petroleum products, inks, aldehydes, silicates, halogenated hydrocarbons, sulfur, paints, lead compounds, organic solvents, lacquers, oils, chemicals, organic and metallic dusts.

These material exposures represent potential, but not necessarily actual health hazards. Detailed quantitative studies are necessary in order to determine the degree of hazard due to exposure to any of these materials in any particular workroom.

The physiological effects of exposure to the three most prevalent potential health hazards listed (alcohol vapor, carbon dioxide, and excessive dampness), have been discussed briefly. These are not necessarily the most dangerous exposures. All three are encountered to some extent by cellar workers, pomace shovelers, wine makers, chemists, press operators, tank washers, and hose men in their work.

Quantitative determinations of the amount of alcohol vapor present in the air at the breathing level of employees in various departments of the fifty wineries studied, indicate that the workrooms in which these vapors are most likely to be present in potentially dangerous quantities are fermentation rooms, brandy receiving rooms, fortifying rooms and sherry baking rooms.

One-third of the 1093 employees exposed to alcohol vapors are provided with some degree of protection from the harmful effects of inhaling these vapors, by enclosed processes, the use of positive ventilation to force fresh air into the workroom, or local or general exhaust ventilation to withdraw the vapors from the breathing level of workers. Similar control measures are provided for the protection of about one-half of the 767 employees exposed to carbon dioxide gas. Ninety-two per cent of the 731 employees whose work involves exposure to excessive dampness are provided with some type of protective clothing, such as rubber boots, coats, aprons and gloves.

The percentage of employees exposed to other potentially harmful materials, who are provided with

protective clothing, include those coming in contact with alkalis, 72 per cent; inorganic salts, 39 per cent; lacquers and varnishes, 33 per cent; paints and enamels, 29 per cent; lead compounds, 29 per cent; chemicals, 22 per cent; organic acids, 18 per cent; inks, 9 per cent; organic solvents, 9 per cent and oils, 8 per cent. Personal respiratory devices, such as respirators or gas masks, are provided for the protection of between 8 per cent and 27 per cent of all workers exposed to paints, lacquers, lead compounds, organic solvents, and silica and organic dusts. About three-fourths of all employees exposed to silica and silicate dusts are protected to some extent by wet methods of handling these materials, which greatly reduces the amount of dust liberated into the air.

An analysis of case reports of fatalities among California winery employees, which have been attributed to poisoning by alcohol vapors, or to asphyxiation by carbon dioxide gas, shows that in most cases the victim has had some preexisting organic disease, or has failed to comply with plant safety orders.

A brief outline of wine-making processes is included in this report.

#### CONCLUSIONS

Based on the information obtained in this survey, the analysis of morbidity and mortality statistics, interviews with employers and employees, and personal observations of working conditions, the following measures are suggested for the protection of health and the improvement of efficiency of winery employees. Many of the provisions are already in effect in a majority of plants:

1. All new employees should be given a thorough physical examination, for the purpose of placing them in work for which they are physically fitted. Chronic alcoholics, epileptics and persons suffering from other nervous disorders should not be assigned to work in rooms where alcohol vapor is constantly present in the air. Persons with chronic heart disease should be excluded from occupations involving strenuous physical exertion, such as pomace shoveling and tank washing.

2. All employees should be examined physically at regular intervals, at least once yearly, in order to detect and treat physical defects and diseases in their incipency.

3. Adequate ventilation should be provided in all workrooms. In places where alcohol vapors, carbon dioxide or sulfur dioxide gas may be liberated into the air in large quantities, such as fermenting rooms, wine storage and treatment cellars, fortifying rooms and sherry baking rooms, it is advisable to supplement natural ventilation with provisions for forcing in additional fresh air by positive pressure fans, or for exhausting the dangerous gases from the workroom with suction fans.



4. All workrooms should be well lighted. This is particularly important in those departments such as fermenting rooms and storage cellars, where employees climb ladders and walk along slippery elevated runways and where poor illumination may cause a misstep and serious injury from a fall.

5. Employees should be educated in the advantages of good personal hygiene. Clean, adequate toilet, washing and drinking water facilities should be provided.

6. Crusher and press operators, pomace shovelers, hose men, pump men, bottle, barrel and tank washers and other employees exposed to dampness should be provided with waterproof boots and clothing. If possible, they should have the use of a locker room where they can change from damp to dry clothing before leaving the plant and where wet clothing can be hung up to dry.

7. Wet workrooms should have sloping, grooved floors, preferably of concrete, to insure good drainage.

8. Provisions should be made for forced positive or negative local ventilation of fermentation tanks while workmen are in the tanks shoveling pomace.

9. Emptied wine storage tanks should be flushed thoroughly to remove all carbon dioxide and alcohol vapors before workmen enter to clean them.

10. At least two men should be required to work together in all occupations in which there is a possibility of exposure to high concentrations of carbon dioxide or alcohol vapors, such as pomace shoveling, tank cleaning, sherry baking and fortifying.

11. The substitution of mechanical for manual methods of bottle and barrel filling will reduce materially the amount of alcohol vapor inhaled by employees in these departments.

12. A gas mask of approved type should be immediately available for use in emergencies in every plant where ammonia or other toxic gas is used as a refrigerant.

13. Each plant, regardless of size, should have one employee designated as safety director, responsible for the enforcement of safety rules, the maintenance in good working order of safeguards and protective devices provided for the prevention of accidents, the control of health hazards, the education of employees in the necessity of strict compliance with safety orders and the invariable use of protective measures.

14. Employees should be encouraged to cooperate, through shop committees, in the initiation and enforcement of safety and health protective measures.

15. A well stocked first-aid kit is the minimum in medical facilities, which should be available in every plant. Employees should be given courses of instruction in first-aid work. At least one person who has had training in the Schaefer method of artificial respiration should be immediately available at all times in wineries.

The owners of most of the wineries visited in this survey are taking a gratifying interest in the health and welfare of their employees and have devoted

much money, thought and energy, to the improvement of working conditions in their plants. However, the great majority of wineries employ less than 100 workers and it is generally recognized that in most small industrial establishments it is economically impossible to carry out an adequate industrial health program without outside assistance. The Industrial Hygiene Service of the California State Department of Public Health welcomes the opportunity to render such assistance by cooperating with industries in the study and control of their occupational health problems.

## DISEASES REPORTABLE IN CALIFORNIA

### REPORTABLE ONLY

Anthrax	Malaria*
Beriberi	Pellagra
Botulism	Pneumonia (Lobar)
Chancroid	Relapsing Fever
Coccidioidal Granuloma	Rocky Mountain Spotted Fever
Dengue*	Septic Sore Throat
Fluke Infection	Tetanus
Food Poisoning	Trichinosis
Glanders†	Tularemia
Hookworm	Undulant Fever
Jaundice (Infectious)	
Lymphogranuloma Inguinale	

### ISOLATION OF PATIENT

Chickenpox	Ophthalmia Neonatorum
Dysentery (Amoebic)	Psittacosis
Dysentery (Bacillary)	Rabies (Animal)
Erysipelas	Rabies (Human)
German Measles	Syphilis
Gonococcus Infection	Trachoma
Influenza	Tuberculosis
Measles	Whooping Cough
Mumps	

### QUARANTINABLE

Cholera†	Scarlet Fever
Diphtheria	Smallpox
Encephalitis (Epidemic)	Typhoid and Paratyphoid Fever
Leprosy	Typhus Fever
Meningitis (Epidemic)	Yellow Fever†
Plague†	
Acute Anterior Poliomyelitis	

\* Patients should be kept in mosquito-free room.

† Cases to be reported to State Department of Public Health by telephone or telegraph and special instructions will be issued.

## MORBIDITY

Complete Reports for Following Diseases for Week Ending February 11, 1939.

### Chickenpox

839 cases: Alameda County 12, Alameda 10, Albany 1, Berkeley 12, Emeryville 4, Hayward 1, Oakland 30, Piedmont 1, San Leandro 3, Chico 1, Colusa County 1, Colusa 1, Contra Costa County 11, Antioch 20, Concord 6, Martinez 1, Fresno County 23, Fresno 18, Imperial County 5, Brawley 2, Calexico 1, Holtville 4, Inyo County 4, Kern County 3, Tehachapi 1, Los Angeles



County 65, Alhambra 5, Arcadia 3, Burbank 1, Compton 1, Glendale 2, Huntington Park 1, Inglewood 3, Long Beach 12, Los Angeles 75, Monrovia 4, Pasadena 7, San Gabriel 1, San Marino 3, Santa Monica 2, Lynwood 1, South Gate 3, Monterey Park 2, Maywood 1, Bell 1, Gardena 1, Madera County 24, Madera 14, Chowchilla 2, San Anselmo 1, Mariposa County 1, Merced County 23, Merced 25, Atwater 1, Monterey County 5, Napa County 1, Grass Valley 10, Orange County 8, Anaheim 3, Brea 1, Newport Beach 2, Orange 3, Banning 2, Beaumont 3, Sacramento 27, Ontario 8, San Diego County 16, Chula Vista 4, Oceanside 2, San Diego 31, San Francisco 80, San Joaquin County 37, Stockton 17, Tracy 8, San Luis Obispo County 2, Arroyo Grande 1, San Mateo County 11, Burlingame 1, Daly City 3, San Mateo 8, Santa Barbara County 3, Santa Barbara 2, Santa Clara County 5, Mountain View 6, Palo Alto 6, San Jose 11, Santa Cruz County 5, Shasta County 1, Redding 1, Siskiyou County 1, Sonoma County 2, Stanislaus County 7, Modesto 1, Oakdale 7, Tehama County 1, Red Bluff 8, Tulare County 7, Dinuba 2, Porterville 4, Santa Paula 2, Winters 2.

#### Diphtheria

27 cases: Oroville 1, Colusa County 1, Fresno County 1, Hanford 1, Los Angeles County 3, Glendale 1, Los Angeles 8, Santa Monica 1, Pacific Grove 1, Orange County 1, Indio 1, Sacramento 1, San Bernardino County 1, San Francisco 5.

#### German Measles

33 cases: Alameda County 1, Alameda 2, Berkeley 3, Oakland 3, San Leandro 1, Los Angeles County 1, Los Angeles 2, Monrovia 1, Pasadena 1, Whittier 1, Mariposa County 10, Anaheim 1, Fullerton 1, San Francisco 3, Santa Clara County 1, Mountain View 1.

#### Influenza

52 cases: Fresno County 7, Los Angeles County 3, Beverly Hills 1, Burbank 1, El Monte 1, Los Angeles 19, Pasadena 1, San Fernando 1, South Gate 1, Chowchilla 1, Redlands 1, San Francisco 1, Tehama County 6, Corning 8.

#### Measles

2817 cases: Alameda County 149, Alameda 58, Albany 11, Berkeley 155, Emeryville 11, Hayward 28, Oakland 408, Piedmont 10, Pleasanton 11, San Leandro 59, Contra Costa County 24, El Cerrito 24, Martinez 2, Pittsburg 45, Fresno County 10, Fresno 19, Lake County 1, Los Angeles County 24, Alhambra 2, Arcadia 1, Burbank 10, Glendale 14, Inglewood 1, Long Beach 26, Los Angeles 123, Monrovia 5, Montebello 17, Pasadena 2, Santa Monica 2, Torrance 2, South Gate 2, Madera County 13, Madera 1, Chowchilla 8, Marin County 20, Ross 6, San Anselmo 17, Sausalito 1, Fairfax 2, Mariposa County 4, Monterey County 1, Napa 1, Grass Valley 2, Orange County 11, Anaheim 1, Fullerton 1, Newport Beach 1, Orange 2, Santa Ana 1, Riverside County 14, Perris 3, Riverside 28, Sacramento County 3, Sacramento 28, North Sacramento 16, Redlands 3, San Diego County 5, Oceanside 1, San Diego 23, San Francisco 756, San Joaquin County 11, Stockton 32, San Luis Obispo County 19, Paso Robles 1, San Mateo County 59, Burlingame 14, Daly City 32, Hillsborough 1, Redwood City 42, San Bruno 12, San Mateo 9, South San Francisco 11, Atherton 1, San Carlos 1, Menlo Park 3, Belmont 1, Santa Barbara County 2, Santa Clara County 76, Palo Alto 6, San Jose 151, Santa Clara 2, Watsonville 5, Siskiyou County 11, Solano County 8, Suisun 1, Vallejo 3, Sonoma County 18, Petaluma 1, Stanislaus County 14, Tehama County 34, Corning 3, Tulare County 1, Exeter 3.

#### Mumps

976 cases: Alameda County 12, Alameda 7, Albany 26, Berkeley 83, Emeryville 3, Hayward 5, Oakland 119, Piedmont 29, Pleasanton 2, San Leandro 13, Contra Costa County 4, El Cerrito 18, Martinez 7, Pittsburg 4, Fresno County 24, Fresno 3, Kern County 67, Bakersfield 1, Los Angeles County 11, Beverly Hills 6, Glendale 7, Long Beach 1, Los Angeles 26, Monrovia 4, Pasadena 1, Pomona 1, Santa Monica 1, South Pasadena 1, Maywood 1, Madera County 18, Chowchilla 2, Woodland 6, National Park 4, Mendocino County 3, Merced County 61, Gustine 3, Merced 70, Monterey County 2, Orange County 3, Santa Ana 5, Placer County 29, Plumas County 1, Riverside 3, Sacramento County 2, Sacramento 23, Hollister 4, Ontario 3, San Diego County 10, Chula Vista 2, Oceanside 5, San Diego 11, San Francisco 79, San Joaquin County 14, Stockton 16, Tracy 1, San Luis Obispo County 3, Arroyo Grande 1, San Luis Obispo 14, San Mateo County 11, Burlingame 6, Santa Barbara County 3, Santa Barbara 3, Santa Maria 2, Santa Clara County 4, San Jose 2, Siskiyou County 1, Solano County 11, Suisun 1, Vallejo 3, Stanislaus County 3, Modesto 2, Corning 1, Trinity County 2, Tulare County 18, Dinuba 2, Exeter 6, Porterville 2, Visalia 1, Ventura County 4, Yolo County 3.

#### Pneumonia (Lobar)

74 cases: Colusa 1, Fresno County 1, Fresno 3, Kern County 1, Bakersfield 1, Los Angeles County 8, Alhambra 1, Burbank 1, El Monte 1, Glendale 2, Inglewood 1, Los Angeles 18, Pasadena 3, Whittier 1, Torrance 1, Fort Bragg 1, Monterey County 1, Napa County 1, Newport Beach 1, Santa Ana 2, Sacramento County 3, Sacramento 5, San Francisco 11, San Luis Obispo County 1, San Jose 1, Sonoma County 2, Tulare County 1.

#### Scarlet Fever

216 cases: Albany 1, Oakland 7, Chico 1, Martinez 1, Fresno County 7, Fresno 4, Sanger 2, Calexico 1, El Centro 3, Kern

County 2, Lake County 2, Los Angeles County 26, Beverly Hills 1, Burbank 1, Compton 1, El Monte 2, Glendale 2, Hermosa 1, Long Beach 4, Los Angeles 58, Monrovia 1, Pasadena 3, San Gabriel 1, Santa Monica 2, Whittier 1, Torrance 1, Lynwood 1, Monterey Park 1, Merced County 2, Monterey County 2, Orange County 2, Newport Beach 1, Santa Ana 1, Riverside County 1, Elsinore 2, Riverside 1, San Jacinto 1, Sacramento County 1, Sacramento 4, North Sacramento 1, San Diego County 1, San Diego 5, San Francisco 22, San Joaquin County 2, San Luis Obispo County 1, Arroyo Grande 1, Daly City 1, San Bruno 1, San Mateo 1, Santa Barbara 2, Santa Clara County 1, San Jose 1, Santa Cruz County 1, Shasta County 1, Solano County 1, Sonoma County 1, Stanislaus County 2, Turlock 2, Sutter County 2, Tehama County 5, Red Bluff 1, Tulare County 1, Lindsay 1, Porterville 1, Ventura County 1.

#### Smallpox

16 cases: Fresno County 2, Imperial County 1, Long Beach 5, Sacramento 4, Redwood City 1, Tulare County 1, California 2.\*

#### Typhoid Fever

5 cases: Fresno County 1, Imperial County 1, Los Angeles 1, Merced County 1, Tulare County 1.

#### Whooping Cough

102 cases: Berkeley 2, Oakland 1, Los Angeles County 5, Glendale 7, Long Beach 11, Los Angeles 14, South Pasadena 2, Hawthorne 1, Madera 1, Marin County 1, Monterey County 1, King City 1, Orange County 2, Fullerton 2, Santa Ana 2, San Diego County 5, National City 1, Oceanside 4, San Diego 19, San Francisco 4, San Joaquin County 3, San Mateo 1, Santa Barbara 5, Sonoma County 2, Petaluma 2, Porterville 1, Ventura County 1, Yolo County 1.

#### Meningitis (Epidemic)

One case: Los Angeles.

#### Dysentery (Amoebic)

3 cases: Riverside County 1, Ontario 1, Modesto 1.

#### Dysentery (Bacillary)

6 cases: Los Angeles 3, San Fernando 1, Hawthorne 1, Sonoma County 1.

#### Leprosy

One case: San Gabriel.

#### Ophthalmia Neonatorum

One case: Arroyo Grande.

#### Pellagra

One case: Los Angeles.

#### Polyomyelitis

2 cases: Imperial.

#### Tetanus

One case: Los Angeles.

#### Trachoma

5 cases: Fresno County 1, Los Angeles 2, San Francisco 1, Tulare County 1.

#### Botulism

One case: Glendale.

#### Food Poisoning

3 cases: San Francisco.

#### Undulant Fever

5 cases: Los Angeles County 1, Pasadena 1, Fullerton 1, Ontario 1, Lindsay 1.

#### Coccidioides Granuloma

One case: Kern County.

#### Septic Sore Throat

8 cases: Bakersfield 1, Los Angeles County 1, Pasadena 5, San Diego 1.

#### Rabies (Animal)

25 cases: Fresno County 1, Imperial County 1, Kern County 3, Bakersfield 2, Los Angeles County 3, Compton 1, Glendale 1, Hermosa 1, Los Angeles 5, Monrovia 1, Pomona 1, San Diego 1, Santa Clara County 2, Gilroy 1, San Jose 1.

\* Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.